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AF/2858

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November 17, 2003
Date of Signature

Re:	Application of:	Romero et al.
	Serial No.:	09/882,786
	Filed:	June 15, 2001
	For:	Improved Testing Implementation for Signal Characterization
	Group Art Unit:	2858
	Examiner:	Walter Benson
	Our Docket No.:	00-573 (1003-0559)

TRANSMITTAL OF BRIEF ON APPEAL

Please find for filing in connection with the above patent application the following documents:

1. Original of the Appeal Brief;
2. Three (3) copies of the Appeal Brief; and
3. One (1) return post card.

The Commissioner is hereby authorized to charge the filing fee of an Appeal Brief ($330.00) as required by 37 C.F.R. § 1.17(e) to **Deposit Account No. 12-2252.**

Since the due date of filing an Appeal Brief fell on Sunday, November 16, 2003, the Appeal Brief is being timely filed on Monday, November 17, 2003. Please charge any fee deficiency, or credit any overpayment, to Deposit Account No. 12-2252 but not to include any payment of issue fees.

Respectfully Submitted,

MAGINOT, MOORE & BECK, LLP

November 17, 2003

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Enclosures

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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BRIEF ON APPEAL

Sir:

This is an appeal under 37 CFR § 1.191 to the Board of Patent Appeals and Interferences of the United States Patent and Trademark Office from the final rejection of claims 1-6, 11-16 and 21 of the above-identified patent application. These claims were indicated as finally rejected in an Office Action dated June 19, 2003. Three copies of the brief are filed herewith.

Authorization is hereby provided to charge the fee required under 37 CFR § 1.17(f) ($330.00) to

Deposit Account 12-2252.

(1) REAL PARTY IN INTEREST

LSI Logic Corporation is the owner of this patent application, and therefore is the real party in interest.

(2) RELATED APPEALS AND INTERFERENCES

There are no appeals or interferences related to this patent application.

(3) STATUS OF CLAIMS

Claims 1-7, 11-17 and 21 are pending in the application.

Claims 1-6, 11-16 and 21 stand rejected and form the subject matter of this appeal. The subject matter of claims 7 and 17 has been deemed allowable if rewritten to incorporate the limitations of the base claim and any intervening claims.

Claims 1-7, 11-17 and 21 are shown in the Appendix attached to this Appeal Brief.

(4) STATUS OF AMENDMENTS

Applicants filed a Response to Office Action on March 31, 2003 ("Response") responsive to an Office Action dated December 31, 2002. A Final Office Action dated June 19, 2003 was designated by the Examiner to be responsive to the Response. Applicants have filed no amendments after receipt of the June 19, 2003 Final Office Action.

(5) SUMMARY OF THE INVENTION

The present invention relates to signal testing.

Claim 1 is directed to an apparatus for enabling signal testing in a test configuration. The apparatus includes a cable environment embodied as a portable housing structure including a plurality of cables exhibiting a plurality of lengths and impedances. (See nonlimiting examples in Application, element 10 of FIGs. 1-3). At least a portion of each of the cables is supported within the portable housing structure (see, e.g. FIGs. 2-3) and a user can selectively connect any one of the cables between a host device and a target device. (See nonlimiting examples at FIGs. 5-9).

With more specificity to nonlimiting exemplary embodiments, a schematic diagram of a cable environment with signal measurement connectors constructed according to principles of the present invention is shown in FIG. 1 of the Application. In FIG. 1, a cable environment 10 is constructed as a portable housing structure containing a plurality of different cables. The cable environment 10 may include a handle, wheels and/or other means (not shown in FIG. 1) by which a user may quickly and efficiently move the cable environment 10 between different signal testing locations. According to an exemplary embodiment, each of the cables included in the cable environment 10 is a different type. For example, it is contemplated that one or more of the following types of cables may be used: twisted pair round cable, flat ribbon cable, and flat ribbon twisted pair cable. Other types of cables may also be used in accordance with principles of the present invention. Moreover, the cable environment 10 may be constructed to include one or more backplanes. It may also be preferable to include cables from different cable manufacturers, such as Hitachi, Madison, Tempflex and/or other manufacturers. It may also be preferable to include cables of different lengths. For example, it is contemplated that cable lengths of 1 meter, 12 meters, 25 meters and/or other lengths may be utilized. It may also be

preferable to include cables of different impedances. For example, it is contemplated that low voltage differential (LVD) impedances in the range of 110 ohms to 135 ohms may be used. However, other impedance values may also be used. Accordingly, to ensure a wide test coverage, the cable environment 10 may include cables of various types, lengths, manufacturers and impedances. The number of such variations for the cable environment 10 is countless, with each one being within the inventive scope of the present invention. The specific parameter variations selected for a given embodiment of the present invention are simply a matter of design choice. (See Specification at p.5, line 12 to p.6, line 13, see also Fig. 1).

One or more signal measurement connectors 20 may be connected to both ends of the cable environment 10. Each of the signal measurement connectors 20 connects to a cable connector (not shown in FIG. 1) of the cable environment 10 to facilitate a signal testing process. In particular, each of the signal measurement connectors 20 provides one or more dedicated test measurement points to which a signal testing device such as an oscilloscope may be connected. In the exemplary embodiment of FIG. 1, there are four signal measurement connectors 20 coupled to each end of the cable environment 10. However, any number of signal measurement connectors could be utilized in accordance with principles of the present invention. (Application at p.6, line 15 to p.7, line 2).

A schematic diagram providing details of a first embodiment of a cable environment 10 constructed according to principles of the present invention is shown in FIG. 2. In particular, FIG. 2 shows an embodiment where the cable lengths and impedances are selected by a user physically connecting a corresponding cable between a host device and a target device. As will be discussed later herein, the present invention also includes an embodiment for the cable environment 10 where a user may select a given cable length and/or impedance through an input

to a mechanism such as a switch. In FIG. 2, the cable environment 10 includes four cables, wherein at least a portion of each cable is fixedly supported within the housing of the cable environment 10. Each of the cables exhibits a specific, fixed length and impedance. Again, the specific lengths and impedances used in practice are simply a matter of design choice. Also, it should be intuitive that any number of such cables may be used according to principles of the present invention. Each of the four cables in FIG. 2 includes a pair of cable connectors designated by reference numerals 11, 12, 13 and 14, respectively. According to a preferred embodiment, each of the cable connectors 11 to 14 connects to a signal measurement connector 20, as indicated in FIG. 1. (Specification at p.7, lines 4-20; See also FIG. 3).

A schematic diagram providing details of a second embodiment of a cable environment 10 constructed according to principles of the present invention is shown in FIG. 3. In particular, FIG. 3 shows an embodiment where the cable lengths and impedances are selectable through user inputs to a mechanism such as a switch. In FIG. 3, a pair of cable connectors 15 is provided for connection to corresponding signal measurement connectors 20 in the manner indicated in FIG. 1. It should be intuitive that any number of such cable connectors 15 may be provided in accordance with principles of the present invention. The cable environment 10 of FIG. 3 also includes four cables wherein at least a portion of each of the cables is embodied within the housing of the cable environment 10. Each of the cables has a different length and/or impedance. Any number of such cables may be included in accordance with principles of the present invention. Relays 16 are connected to the cables and operate as switches, thereby enabling a user to select any one of the cables. The relays 16 may be embodied on a PC board or card which connects to the individual cables. Link connectors 17 are provided for electrically connecting the relays 16 to the cable connectors 15. The relays 16 may be controlled in a variety

of ways such as by one or more external switches, or through software using a parallel port. In this manner, the user may conveniently select a cable having a desired length and/or impedance. (See Specification at p.7, line 22 to p.8, line 17; see also FIG. 3).

According to an alternative embodiment, a cable environment 10 providing variable cables lengths and/or impedances may be achieved using a custom backplane containing a plurality of switches. In this embodiment, the switches enable a user to select different path lengths and/or impedances. The backplane switches may be controlled by a plurality of external switches or by software using a parallel port. This embodiment also enables a user to conveniently select a cable having a desired length and/or impedance. However, since the characteristics of a backplane are different from that of a physical cable, this embodiment requires signal characterization on several cable and backplane designs. Also, the switches utilized in this embodiment should be selected so as not to create an excessive impedance mismatch, or regenerate an original test signal. The more switching capability provided to the user may create reflection problems due to multiple connections. Accordingly, these design issues should be taken into consideration when implementing this alternative embodiment.

The above described invention helps in determine signal characteristics in configurations of computer and electronic devices under various cabling conditions.

(6) ISSUES

Whether claims 1-4 and 11-14 are unpatentable under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 4,941,115 to Nihart (hereinafter "Nihart") in view of U.S. Patent No. 5,299,306 to Asprey (hereinafter "Asprey");

Whether claims 5 and 15 are unpatentable under 35 U.S.C. § 103(a) as being obvious

over Nihart in view of Asprey in further view of U.S. Patent No. 3,571,752 to Sturm, Jr. (hereinafter "Sturm");

Whether claims 6 and 16 are unpatentable under 35 U.S.C. § 103(a) as being obvious over Nihart in view of Asprey in further view of U.S. Patent No. 5,926,031 to Wallace (hereinafter "Wallace"); and

Whether claim 21 are unpatentable under 35 U.S.C. § 103(a) as being obvious over Nihart in view of Asprey in further view of U.S. Patent No. 6,341,358 to Bagg (hereinafter "Bagg").

(7) GROUPING OF CLAIMS

The claims stand or fall together.

(8) ARGUMENT

Claims 1-6 and 11-16 and 21 Are Not Obvious Over Nihart and Asprey

Discussion re: Patentability of Claim 1

1. <u>Claim 1</u>

Claim 1 recites the following limitations:

> a portable housing structure including a plurality of cables exhibiting a plurality of lengths and impedances.

As will be discussed below, the obviousness rejection of claim 1 is in error because there is no motivation or suggestion to combine the Nihart and Asprey references as proposed by the Examiner.

2. There is No Motivation or Suggestion to Make the Proposed Combination

In the June 19, 2003 office action, the Examiner provided the following reasoning for the rejection of claim 1:

> As to Claims 1 and 11, Nihart teaches a hand held tester connecting a host device and a target device, considered to be the input/output ports of a DP system, such as peripheral devices to a central processor, the claimed impedances, considered to be a balun (Col. 4, lines 6-10). Nihart teaches connectors, but lacks the cables. Asprey teaches that it is well known to use terminals/extender cable lengths with an impedance matching network (Col. 12, lines 5-15). One of ordinary skill in the art would have readily recognized the advantage and desirability to use cables in order to achieve critical dampening in some systems and devices.

(Final Office Action at p.2).

Thus, the Examiner relies on Asprey for supplying the teaching of the use of "a plurality of cables exhibiting a plurality of lengths and impedances" in a portable housing structure, which is not taught otherwise taught by Nihart. Even if it were assumed that Asprey taught the use of terminals/extender cable lengths for critical damping, which it does not, there is no motivation or suggestion to replace the baluns of Nihart with such "terminals/extender cable lengths".

a. No Motivation to Replace the Baluns of Nihart

Nihart teaches a test device in which baluns are used to accomplish impedance matching. Indeed, the impedance of the baluns may even be adjustable depending on the cable length of the system under test. The Examiner appears to propose the replacement of the baluns with cables of different lengths as allegedly (but not in fact) taught by Asprey.

Even if Asprey taught the use of cables of different lengths for use in impedance matching, Asprey does not teach the desirability of replacing a balun with cables of different lengths. Furthermore, Asprey certainly does not teach or suggest the desirability of replacing a balun with cables of various lengths *within a handheld tester* such as the one taught by Nihart. Thus, Asprey does not provide any motivation or suggestion to replace the baluns of Nihart with

a plurality of cables.

The only motivation or suggestion for the combination cited by the Examiner is that "one of ordinary skill in the art would have recognized the advantage and desirability to use cables to achieve critical dampening in some systems or devices". (Final Office Action at pp.2-3). Applicants respectfully submit that neither Nihart nor Asprey discuss a single advantage of using cables to achieve critical damping in a test device such as the one taught by Nihart. Specifically, Nihart teaches the use of a balun, and makes no mention of the use of cables of different lengths as a replacement. Asprey similarly makes no mention of the use of cables of different lengths for any purpose within a portable test device. Asprey also fails to discuss any *advantages* of using cables of various lengths. Accordingly, the cited art does not suggest the "advantage and desirability to use cables to achieve critical dampening", as contended by the Examiner.

The error in the Examiner's obviousness argument results from a mischaracterization of the teachings of Asprey. As quoted above, the Examiner alleges that Asprey "teaches that it is well known to use terminals/extender cable lengths with an impedance matching network". To the contrary of the Examiner's assertion, Asprey appears to teach that "terminals/extender cable lengths" *create* impedance problems that *require* balancing by some other means. In other words, the "terminals/extender cable lengths" of Asprey are *part of the system under test*, and must be compensated for within the test unit. This is quite the opposite of teaching the intentional addition of "terminals/extender cable lengths" to operate as a desired impedance matching circuit in a hand held device.

In particular, the portion of Asprey cited by the Examiner in support of the Examiner's rejection is set forth below, along with additional context from Asprey:

> While this resistor works well enough in most cases to provide critical damping of the signal, other schemes to achieve critical damping may be desirable with some combinations of computers

> and terminals/extender cable lengths and include an impedance matching network 508, as shown for the G signal, and yet another network 510 as shown for the B signal. Network 508 (G signal) consists of a resistor 512 of approximately 100 ohms in series with a very small capacitor 513 of approximately 100 pf, these components being parallel with resistor 515 (approximately 100 ohms) as shown. The value of capacitor 513 is selected according to the length of extender cable 200, and for shorter cable lengths of less than approximately 50 feet, it may be left out entirely. Its maximum value, for a 300-foot cable, is approximately 100 pf, with lower value capacitors used for shorter cable lengths. This network provides slightly better damping characteristics for higher frequencies than resistor 506 by itself.

(Asprey at col. 12, lines 5-24).

Thus, Asprey states that "other schemes to achieve critical damping may be desirable *with* some combinations of computers and terminals/extender cable lengths". In other words, some combinations of computers and terminals/extender cable lengths may require other schemes to achieve critical damping. Moreover, these "other schemes" taught by Asprey include "an impedance matching network 508". The impedance matching network 508 of Asprey consists of resistors and capacitors, not cables of different lengths. Thus, the teaching of Asprey is to add resistors and capacitors to adjust for the *problems* created by cables of different lengths.

Thus, Asprey does not teach or suggest any useful purpose of "terminals/extender cable lengths", much less that such devices could be useful in a handheld testing device such as that taught by Nihart.

For at least this reason, it is respectfully submitted that the Examiner has failed to allege a legally sufficient motivation or suggestion to modify the test device of Nihart by replacing the baluns with the "terminals/extender cable lengths" of Asprey. Even if there were a suggestion to replace the baluns of Nihart with the impedance matching network of Asprey, then such replacement network would include resistors and capacitors, and not of "a plurality of cables exhibiting a plurality of lengths and impedances of cables", as called for in claim 1. Accordingly, the rejection of claim 1 over Nihart in view of Asprey is in error and should be reversed.

3. The Examiner's Response to Arguments

Many of the arguments set forth above herein were presented to the Examiner in the Amendment filed March 31, 2003. The Examiner responded in the Final Office Action with two main points. First, the Examiner stated that "Nihart and Asprey are analogous art for monitoring signals over communications lines/cables". Applicants have not argued that Nihart and Asprey constitute nonanalogous art. Second, the Examiner contended that "Applicant filed to consider the Asprey reference as a whole which teaches that it is well known to use terminals/extender cable lengths with an impedance matching network (Col. 12, lines 5-15)." Applicants disagree.

As discussed above, the Examiner mischaracterizes the teachings of Asprey, and clearly mischaracterizes col. 12, lines 5-15 of Asprey, which are quoted further above. The passages of Asprey cited by the Examiner do not teach the use of "terminals/extender cable lengths as a useful impedance matching network, but rather that an impedance matching network may be used to compensate for "terminals/extender cable lengths" of the system under test. The only impedance matching networks taught by Asprey are those that include arrangements of resistors and capacitors.

As a consequence, the Examiner's rejection of claim 1 continues to be based on a mischaracterization of the teachings of Asprey. For this reason, as well as others, the rejection of claim 1 over Nihart and Asprey should be reversed.

Discussion re: Patentability of Claim 2-4

Claims 2-4 all stand rejected as allegedly being obvious over Nihart in view of Asprey. Claims 2-4 all depend from and incorporate all of the limitations of claim 1. Accordingly, for at

least the same reasons as those set forth above in connection with claim 1, it is respectfully submitted that claims 2-4 are patentable over the prior art.

Discussion re: Patentability of Claim 5

Claim 5 stands rejected as allegedly being obvious over Nihart in view of Asprey in further view of Sturm. Claim 5 depends from and incorporates the limitations of claim 1. As discussed above, there is no legally sufficient motivation or suggestion to combine Nihart and Asprey as proposed by the Examiner to arrive at the invention of claim 1. Sturm does not resolve the deficiencies of Nihart and Asprey with regard to such motivation or suggestion, and is not cited by the Examiner for such purpose.

Accordingly, for at least the same reasons as those set forth above in connection with claim 1, it is respectfully submitted that the obviousness rejection of claim 5 should be withdrawn.

Discussion re: Patentability of Claim 6

Claim 6 stands rejected as allegedly being obvious over Nihart in view of Asprey in further view of Wallace. Claim 6 depends from and incorporates the limitations of claim 1. As discussed above, there is no legally sufficient motivation or suggestion to combine Nihart and Asprey as proposed by the Examiner to arrive at the invention of claim 1. Wallace does not resolve the deficiencies of Nihart and Asprey with regard to such motivation or suggestion, and is not cited by the Examiner for such purpose.

Accordingly, for at least the same reasons as those set forth above in connection with claim 1, it is respectfully submitted that the obviousness rejection of claim 6 should be

withdrawn.

Discussion re: Patentability of Claims 11-16

Claims 11-16 stand rejected for reasons identical to those for which claims 1-6, respectively, stand rejected. (See June 19, 2003 office action at pp. 2-4). As discussed above, the rejections of claims 1-6 are in error and should be withdrawn. Accordingly, for substantially the same reasons as those set forth above in connection with claims 1-6, it is respectfully submitted that the rejections of claims 11-16 are in error and should be reversed.

In particular, claims 11-16 all include a method step (directly or through dependency) that recites "moving a cable environment . . . wherein the cable environment is embodied as a portable housing structure including a plurality of cables exhibiting a plurality of lengths and impedances." As discussed above, there is no motivation or suggestion to combine Nihart and Asprey as proposed by the Examiner to teach such a portable housing structure, or its use.

Discussion re: Patentability of Claim 21

Claim 21 stands rejected as allegedly being obvious over Nihart in view of Asprey in further view of Bagg. Claim 21 depends from and incorporates the limitations of claim 11. As discussed above, there is no legally sufficient motivation or suggestion to combine Nihart and Asprey as proposed by the Examiner to arrive at the invention of claim 11. Bagg does not resolve the deficiencies of Nihart and Asprey with regard to such motivation or suggestion, and is not cited by the Examiner for such purpose.

Accordingly, for at least the same reasons as those set forth above in connection with claim 11, it is respectfully submitted that the obviousness rejection of claim 21 should be

withdrawn.

(9) CONCLUSION

For all of the foregoing reasons, claims 1-6, 11-16 and 21 are not unpatentable under 35 U.S.C. § 103, and the Board of Appeals is respectfully requested to reverse the rejection of these claims.

Respectfully submitted,

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CLAIM APPENDIX

1. An apparatus for enabling signal testing in a test configuration, comprising:

a cable environment embodied as a portable housing structure including a plurality of cables exhibiting a plurality of lengths and impedances, wherein at least a portion of each of the cables is supported within the portable housing structure and a user can selectively connect any one of the cables between a host device and a target device.

2. The apparatus of claim 1, further comprising at least one signal measurement connector which is connectable to the cable environment, the at least one signal measurement connector including one or more test measurement points to enable collection of signal testing results.

3. The apparatus of claim 1, wherein the host device is a server.

4. The apparatus of claim 1, wherein the target device is a disk subsystem.

5. (amended) The apparatus of claim 1, wherein the cable environment includes a switch enabling the user to select a cable of a particular length and impedance.

6. The apparatus of claim 1, wherein the signal testing is SCSI signal testing.

7. The apparatus of claim 1, wherein the test configuration is a Y-configuration.

11. A method for enabling signal testing in a test configuration, comprising steps of:

moving a cable environment to a location corresponding to the test configuration, wherein the cable environment is embodied as a portable housing structure including a plurality of cables exhibiting a plurality of lengths and impedances; and

selectively connecting any one of the cables of the cable environment between a host device and a target device.

12. The method of claim 11, further comprising a step of collecting signal testing results by monitoring a signal measurement connector connected to the cable environment.

13. The method of claim 11, wherein the host device is a server.

14. The method of claim 11, wherein the target device is a disk subsystem.

15. The method of claim 11, wherein a user selects a particular cable of the cable environment for connection between the host device and the target device by input to a switch.

16. The method of claim 11, wherein the signal testing is SCSI signal testing.

17. The method of claim 11, wherein the test configuration is a Y-configuration.

21. The method of claim 11 wherein the selectively connecting step further comprises employing a switch to selectively connect any one of the cables of the cable environment between a host device and a target device.